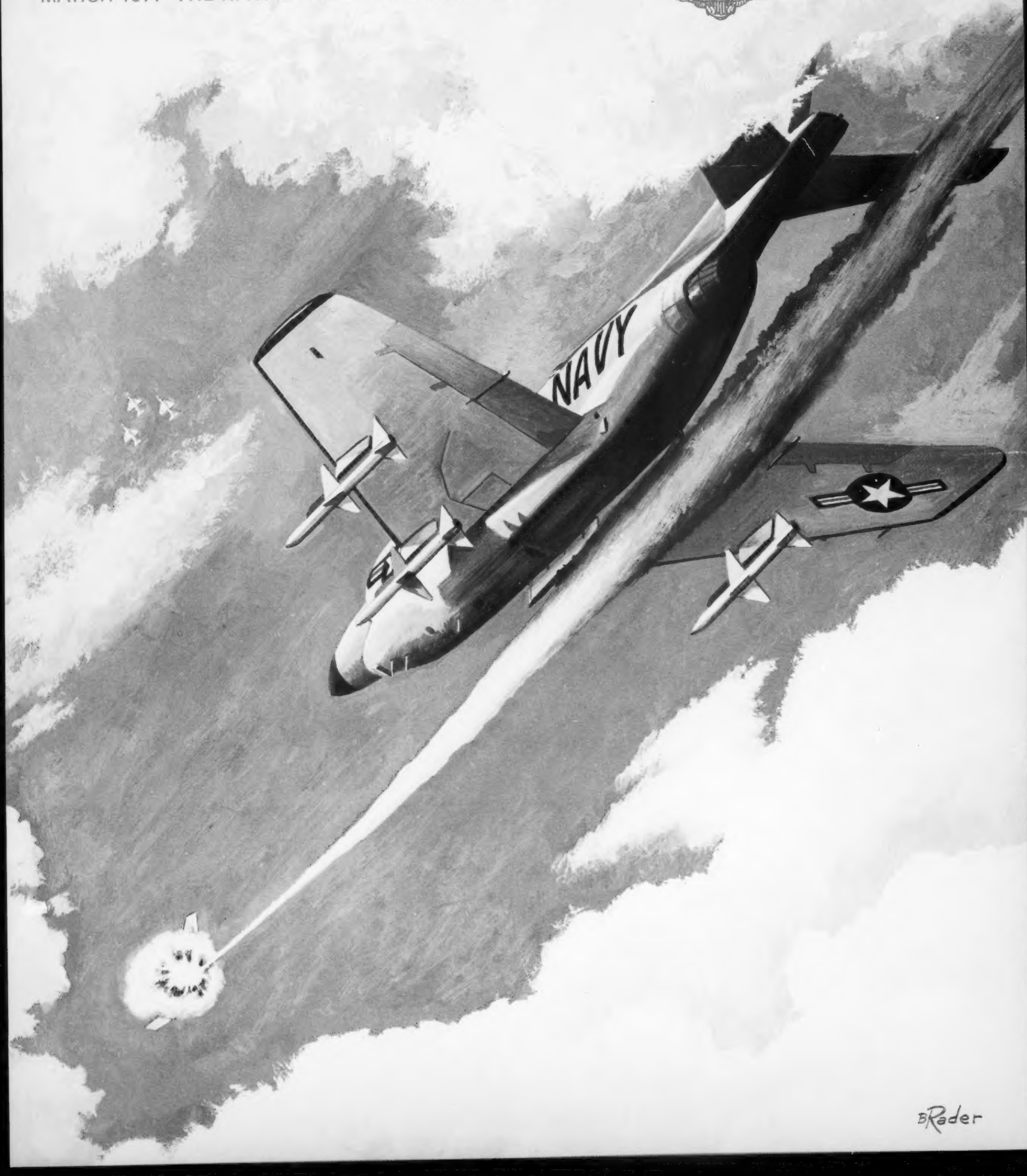
approach

MARCH 1977 THE NAVAL AVIATION SAFETY REVIEW



RVAH The heavy is dead,

but the Recce is alive and flying

The Navywide reputation of the *Vigilante* is founded on rumor rather than fact. Let's face it; a sea story that begins with *"Vigi"* usually ends with "Yah, that's the community that's so top heavy." Or, "That's the big, heavy, underpowered aircraft that's always hitting the ramp." Well, it's time these rumors were disproved. The following story is typical of most people's misconceptions about the RA-5. It's not purely coincidence and not purely fact, but it's close!

By LTJG Daniel M. Carroll
RVAH-7

"WHEN detached, report to CO, RVAH-3, NAS Key West for duty involving flying and operational training." With those brief words, I realized I was being ordered direct from flight training to the notorious *Vigilante.* A quick call to the Training Command aviation detailer confirmed (among other things) that RVAH stood for Heavy; that, no, there are no other Fleet seats available; and that they need YOU *(me!)* in Heavies.

Being well aware of the A-5's reputation and being a Jack Nicholson trained man (having seen the movie "The Last Detail"), I went straight to the XO to see if I could straighten things out. The XO was sympathetic, saying he'd make a phone call. This he did, and it went something like this.

XO: "Hello, John, XO here. How are things in Corpus? Hey, I've got another ensign here who's got orders to *Vigilantes. (Mild laughter.)*

"Yah, that's right, and he'd like to get his orders changed. *(Increased laughter.)*

"Ah, no, he's Reserve. *(Uncontrolled laughter.)*

"Thanks anyhow, John. Bye now."

With that, the XO assured me that I was needed in A-5s and offered, in parting, "Besides, kid, it's a Heavy community. You'll make rank quicker."

I almost would have believed him had he not burst out laughing.

The word "Heavy" continued to haunt me. I couldn't for the life of me figure out how one got Heavy out of RVAH. But there were a lot of things I didn't understand about the Navy. For example, I always thought CNATRA was Sinatra and couldn't figure out what a famous singer was doing in charge of the Navy's flight training!

Realizing that I probably wasn't *supposed* to know everything, this confused but intrepid aviator commenced the southeastward journey to join my Heavy squadron. When my interim stay at the instrument RAG went overtime, it became necessary to call my squadron to let them know why I couldn't report when directed (astutely realizing that the only thing lower than an ensign is a UA ensign). The ensuing conversation confirmed many of my fears.

SDO: "Recce Three duty officer, Captain Jones speaking, sir."

ENS Nugget: (Oh, my God, RECCE! CAPTAIN!) "Ah, excuse me, sir, this is Ensign Nugget, and I must have the wrong number. I was trying to reach . . . *(I paused, put on my best "radio voice," and said)* ah, you know, Heavy Three, the *Vigilante* RAG."

The rest of the

conversation revealed that I had the correct number and the captain was in fact a captain – USAF type, on exchange duty. That conversation and my subsequent experience in RA-5Cs have revealed that most of the rumors about the *Vigilante* and the community are just that – rumors! So, let me clear up these misconceptions with some facts.

First of all, the "Heavy" concept. Well, our community is so top heavy that we have LCDRs as XOs and COs. As for the big, heavy aircraft, the RA-5C comes aboard a carrier weighing less than the sleek new F-14. Yes, sir, and it's so difficult and scary to fly that of the 30 Fleet pilots manning our squadrons today, 15 are making their first tour in type. For all you non-math majors, that comes out to 50 percent; half of our carrier pilots are doing their thing around the ship for the first time in a *Vigilante*. What about ramp strikes, you ask? Oh, yes, there have been some. A total of two in the past 11 years, to be exact. This also dates back to the inception of the approach power compensation system in the A-5.

The truth is the *Vigilante* is a pleasure to fly, the reconnaissance mission is both challenging and rewarding, and the career potential is unlimited. Sure we don't hassle, and we don't drop any bombs. But what other community can continue to provide vital services from its mission whether there's a war on or not? When a recce pilot does fly in combat, there is a great amount of silent pride and professionalism felt in knowing that prior to an attack pilot destroying a target, a recce pilot had to discover it. And after the bombing took place, a recce pilot confirms the damage (or the miss!) for the tactical commander which, by the way, provides the factual basis for the attack pilot's DFC or Silver Star.

It would be idealistic, of course, to say that the *Vigilante* is without negative points. There are several considerations, particularly in carrier landing technique, that must always be given attention. Lineup, for instance, is critical. The speed and weight of the *Vigi,* combined with the large wingspan, make an on-center arrestment extremely important.

A problem related to lineup is the loss of lift incurred every time a lineup correction is made. Since the *Vigi* uses spoiler-deflectors for lateral control, a control input also results in loss of lift. If the pilot is not anticipating this, the aircraft will settle on a lineup correction.

The BLC (boundary layer control) system uses 30 percent of the engine's thrust to improve the aerodynamics of the airfoil. So, when the pilot corrects for a high ball by reducing power, he simultaneously decreases engine thrust and BLC airflow. Here again, if this is not anticipated, the aircraft will settle more than desired.

And, of course, the *Vigilante* is relatively fragile. Landings in excess of the optimum rate of descent or in an attitude other than normal set up a good possibility of cracking a bulkhead. What this means is the *Vigi* pilot cannot get away with the tried and true tricks that have lowered the bolter rate for other aircraft (drop nose in close, nose down to land, coming down all the way, etc.).

Perhaps the biggest safety problem of the *Vigilante* has nothing to do with the aircraft or pilot technique. That hazard is simply the lack of existing aircraft and the resultant lack of flight time. This places extra demands on the aircrews, particularly when deployed, since flying around the boat demands currency whether you are flying a *Vigilante* or a C-1.

Every aircraft has its own quirks, and if a pilot understands and is aware of these idiosyncrasies, the pilot can compensate and operate in a safe fashion. Thus it is with the A-5. As one senior recce pilot put it, "Kid, the *Vig* is a piece of cake to bring aboard. Just remember, D-F-W-T-N-I-C (don't fool with the nose in close), and your landings will always equal your takeoffs."

So, prospective *Vigi* drivers, once you cut through the myths and reveal the facts, you have an outstanding aircraft and a challenging mission. The only thing "heavy" about the *Vigi* community these days is the heavy hearts of the pilots, aware of the impending end of the RA-5C program.

"Navy 105, say present altitude."
"We're out of 8000, climbing."
"Roger, 105, cleared on course, unrestricted climb. Report out of FL200."

PRESSURIZATION LOST

A SECTION of turboprops had executed a standard instrument departure out of NAS and was cleared to FL250. One of the aircraft encountered pressurization problems. The cabin pressurization failed to level off at 5000 feet as it should have, and continued to climb slowly.

The aircraft commander sent one of the crew to check a door seal for proper inflation. The pilot continued climbing above FL200, and the cabin pressure also continued climbing but did not exceed 13,000 feet. The pilot went on oxygen when the cabin pressurization failed to stabilize.

The crewman reported the door seal was inflated and then went off the ICS. The pilot assumed the crewman was returning to the crew compartment, so he sent his copilot aft to check for a stuck cabin pressurization regulator. At this time, passing FL240, cabin pressure suddenly went to 24,000 feet.

The copilot returned to the cockpit and reported the crewman was out cold in the forward equipment compartment. Simultaneously the pilot declared an emergency, began an emergency descent, and the CIC officer went forward with an emergency oxygen bottle to revive the crewman.

The combination of these actions enabled the crewman to recover consciousness, and he was helped back to the crew compartment. The pilot returned to NAS and made an uneventful landing. The crewman was taken to the dispensary, given a medical check, and pronounced OK.

Upon returning to the squadron, the crewman stated he had seen light around the seal. Planning to reset the seal, he improperly used the maintenance test switch to deflate the seal. He planned to reinflate and reseal it. However, immediate and rapid decompression occurred, and the crewman became disoriented and hypoxic, which prevented him from resealing the door. Investigation revealed the seal had a large tear, which was the cause of the light source and the leakage of cabin pressure.

This incident highlights a problem associated with pressurized aircraft. The potential results of rapid decompression is ever present, and crewmen must be prepared to cope with the problem. Sometimes, sticking cabin pressurization valves lead to a false sense of security – and occasionally, unorthodox troubleshooting.

It would have been more prudent on the part of the aircraft commander to have stopped his climb at a lower altitude until the initial problem of leaking pressurization was solved. Additionally, crewmen must inform the aircraft commander of their troubleshooting intentions. Once they get a go-ahead, they must ensure that standard procedures are followed. However, the quick and proper reaction of the crew after depressurization had occurred was commendable.

AIR BREAKS

Think! An A-4 pilot landed his *Skyhawk* one night on a runway over 2 miles long, departed the rollout end, and continued into the boonies for 210 feet before he could stop. The gear didn't collapse, although the tires were embedded 3 to 4 inches in the dirt. Later the aircraft was towed backwards onto planks and onto the concrete with little or no damage.

During his rollout, the starboard brake bottomed out at 75 knots, with about 2000 feet of remaining runway. The pilot thought he could make a left turn at the end and recognized too late that he couldn't. The tower gave winds of 150/10, duty runway was 32, and the runway was dry.

His CO, commenting on the aircraft incident report, had this to say: "Only the roll of the dice prevented this landing from ending in a major aircraft accident. An experienced aviator elected to make a night, downwind landing at altitude [density altitude was about 6000 feet] without a visual landing aid, thus placing himself in a position where he was unable to stop his aircraft, despite almost 2 miles of rollout.

"When brake failure was recognized, lowering the tailhook would have stopped the aircraft. There was one arresting gear almost 900 feet short of the runway end, and another in the overrun 50 feet.

"Volumes have been written concerning cross-country preflight procedures and the effects of complacency upon performance.

"This incident is an inexpensive but forceful reminder that experience does not negate the requirement to think."

"Hey, We're Air . . ." The HAC of an SH-3D was given tower clearance to launch on the LSE's signal. Chocks and chains had been removed but not yet shown to the pilot. The LSE was giving the hold signal.

The pilot at the controls engaged ASE and BAR ALT, and neither one was holding the collective down. The collective increased rapidly to 90 percent torque, and the aircraft lifted to about 5 feet above deck before one of the pilots could grab the controls and get back on deck. The flight lasted between 5 and 7 seconds.

This incident could have resulted in a catastrophe under different circumstances. Allowing a helicopter to become airborne because the collective isn't held down is like a pilot landing wheels up. Neither act is very smart.

Generator Failure. A P-3C, airborne on an operational flight, entered the clouds about an hour and a half after takeoff. After a few moments in the clouds, the No. 3 generator mechanical failure light began to glow dimly. However, 15 minutes later, after breaking into the clear, the light went out. (Previously, the same light had illuminated after the aircraft came off the wash rack, and it was suspected that water contaminated the warning system.) The PPC elected to continue the mission and landed 7.5 hours later.

After landing, a visual inspection revealed no discrepancy, and there were no indications of trouble on ground turnup. Since the wash rack and the airborne incidents, the aircraft flew 20 hours with no further discrepancy on the No. 3 generator.

The CO, using the airborne instance as a springboard, stated that it was not the policy of his command to second-guess warning lights. The PPC's decision to continue the flight in the presence of a warning light was questionable. It must be assumed that the warning light indicates some problem. The fact that the generator mechanical light went out after 15

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minutes was attributed to the absence of moisture, but the same thing can occur due to deterioration of the generator. NATOPS says an engine can be operated for 10 hours with a generator mechanical failure light. Because of this, many pilots believe a flight may be completed as long as 10 hours doesn't elapse after the light comes on. Past experience does not support this; therefore, this squadron is going to submit a NATOPS change to clarify that portion of 10 hours to get the aircraft safely down, rather than to complete a mission.

Canopy Ready to Go. An AV-8A pilot completed the pretakeoff checklist and gave the canopy a pull to ensure it was locked. He then launched, performing a short takeoff. As the *Harrier* accelerated through 160 KIAS, the canopy cracked open about half an inch. The pilot declared an emergency and began to jettison fuel.

The rapid acceleration of the aircraft close to the ground required most of the pilot's attention. Airspeed rapidly rose to over 200 KIAS, and the canopy suddenly flew to the fully open position. It did not depart the aircraft.

Fortunately, the pilot was not totally distracted by the noise and wind blast. He stayed in the pattern and was cleared to land. He made a rolling, vertical landing.

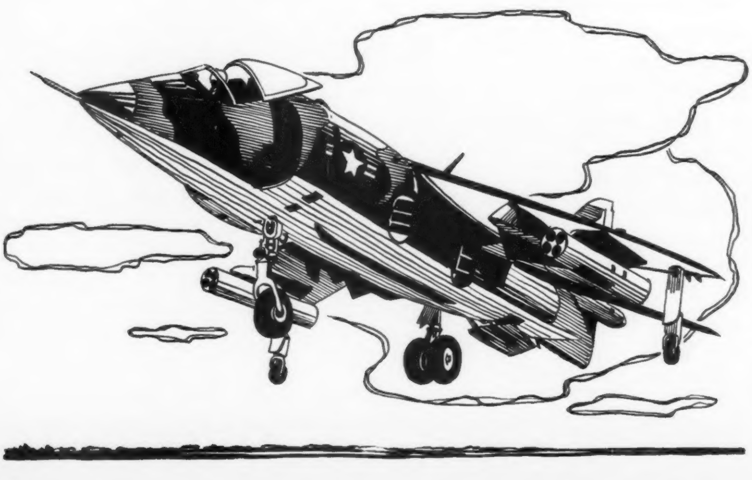
An investigation disclosed that the canopy was not locked at the start of the takeoff roll. The present system consists of two windows on each side of the canopy where locking hooks can be visually inspected. However, the hooks can be so close to the locked position that a mistake in identifying an unsafe canopy is a common error.

Usually the error is found when the pilot pulls on the canopy to ensure it's locked. In this case, the manual check failed to alert the pilot that the canopy locking pins had not engaged properly.

The canopy remained on the aircraft because the footstep retraction cable became wedged in the canopy rails on the initial canopy movement. As the cable was cut, it slowed the opening force enough to prevent the shear bolts from being cut and allowed the canopy to remain on the rails for the short flight. It is possible the same cable kept the pilot from detecting the unlocked canopy when he performed the manual check before takeoff.

Harrier pilots need to watch the canopy hooks as they engage the canopy. Failure to see the hooks during the locking process may make it impossible to determine if the hooks are engaged or if they are overridden by the canopy as it is closing. The hooks would be in approximately the same position, regardless of whether the canopy is locked or unlocked.

The squadron procedure now is to have the pilots grasp the canopy defrost pipes, just aft of where they join the windscreen, when the canopy is closed, and with both hands pull aft with significant force to make the canopy move if it's not properly locked.



CH-53 Kamikaze. It happened again – not once – *but three times in one day* – at the same location! CH-53 downwash during landing and takeoff inflicted damages on smaller helicopters when H-53 pilots overflew parked aircraft.

Tiedowns were snapped, tail rotor drive shaft covers were dented, tail rotor drive shafts were bent, and main rotor blades were flexed excessively. The operation took place in an area simulating an LPH deck marked on the ground.

H-53 pilots can never forget that their wingtip vortices and hurricane-force rotor wash can wreak havoc on objects below. Whether simulating LPH ops at the field or when embarked, H-53 pilots must take all possible steps to avoid overflying other aircraft, troops, or cargo.

This incident could have been avoided by a more thorough briefing of the pilots involved in the exercise, by better control of the flight patterns to be flown, and by more judicious parking and securing of the smaller helicopters. Even so, the first pass by an H-53 inflicting damage on the parked aircraft was bad enough; the second instance was inexcusable; and the third time warrants a big Delta Sierra. ◄

RETREATING BLADE STALL

By LT Luther W. Wheat
VX-6

MOST helicopter pilots are familiar with the phenomenon of retreating blade stall and its effect on aircraft performance and handling qualities. The severe airframe vibrations associated with aggravated stall may reduce weapon system functioning and even aircrew performance to a marginal state. The maximum flight velocity of a conventional helicopter is determined by blade stall characteristics; and the increase in power required to maintain the rotor in a stalled condition is considerable, reducing both range and endurance. Traditional theory predicts that retreating blade stall will originate at the tip of the blade and progress inward toward the hub as the stall condition worsens. This shifting of the aerodynamic load distribution inward has obvious implications in terms of controllability.

A typical helicopter blade experiences two major components of airstream velocity, one resulting from the rotation of the blade and another resulting from forward flight. As airspeed increases, the blade approaching the pilot's 9 o'clock position (the retreating blade) experiences these two velocity components in direct opposition to one another. The rotating velocity component is directly proportional to the distance along the blade, being zero at the hub and a maximum at the blade tip. There exists a point on the blade where the forward flight velocity component equals the rotation velocity component, and between that point and the hub a region of reverse flow exists. The resultant airstream is actually flowing from trailing edge to leading edge. This reverse-flow region is circular in shape, as may be seen in Fig. 1, and its diameter can be as much as one-fourth the length of the blade. The reduction in airstream velocity experienced by the entire retreating blade as a result of forward flight requires a higher angle-of-attack in order to continue generating the necessary lift. This increase in angle-of-attack is what places the blade in the classic stalled condition.

The National Advisory Committee for Aeronautics, a predecessor of the National Aeronautics and Space Administration, conducted extensive research in the 1940's into retreating blade stall and was able to define the stall region as that depicted in Fig. 1. This is generally considered to be an accurate representation of stall for the rotational velocities and forward flight speeds of helicopters flying at the time. Recent work has been conducted at MIT (Massachusetts Institute of Technology) and elsewhere, into the mechanism and dynamics of retreating blade stall in the current generation of helicopters, capable of twice the forward speed available 30 years ago.

Rotor blades today are considerably longer and travel at much higher speeds than those of the 1940's so that the bending and twisting motions of the blades exercise significant influence over retreating blade stall dynamics. Modern helicopters may not stall in the classic sense, but

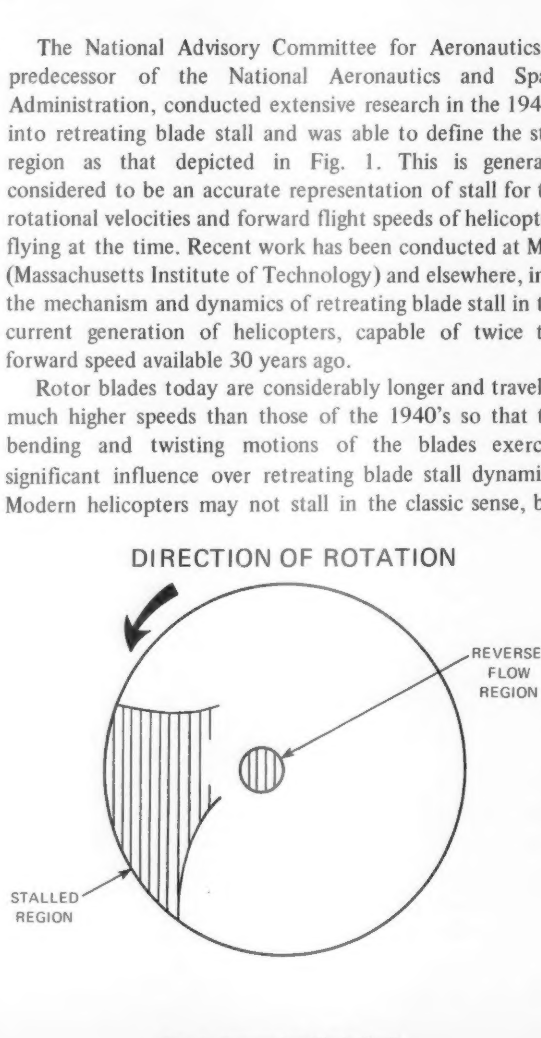


Fig. 1. Retreating Blade Stall

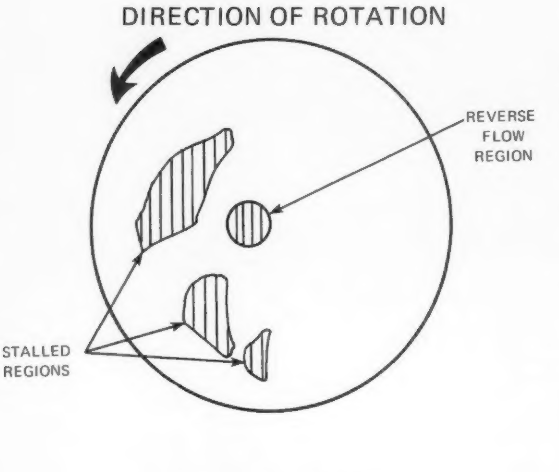


Fig. 2. Dynamic Stall Flutter

rather may undergo what is termed dynamic stall. At extreme angles-of-attack, the torsional rigidity of the blade may allow significant aerodynamic twisting, and the blade goes right to the stalling angle, at which time aerodynamic lifting and twisting loads are released. The blade then goes to a reduced angle-of-attack, and the whole process can begin again. As may be seen in Fig. 2, the retreating blade doesn't stall once but rather as many as three times in an oscillating motion. Dynamic stall will usually be indicated by factors other than the loss of control predicted by the classic stall theory. Higher frequency vibrations – particularly in control system feedback – a sharp rise in power required and a drastic acceleration of moving parts wear are all characteristics of dynamic stall. Pitch links in a rotor system experiencing dynamic stall may be subjected to loads as much as three times their design value.

Since the future of helicopter flight depends in part on continued increases in maximum speed, what are some ways that the onset of stall may be delayed? The most obvious approach would be to aerodynamically clean up the fuselage and hub to reduce airframe drag. A reduction in parasite power required would result in the reduction of the required forward tilt of the rotor plane, hence a lessening of the angle-of-attack experienced by the retreating blade.

A similar approach would be the use of higher rotor RPM which would reduce the required angle-of-attack for a given value of thrust; however, the increase in profile power required to rotate the rotor system may be prohibitive, especially when the tip of the advancing blade approaches sonic velocity. A common practice now in use is physical twisting of the rotor blade tip, 8 degrees down being typical, so that the tip sections experience less of an angle-of-attack than the inboard sections. Improved airfoil cross sections have shown promise, but the rounder leading edges and a slight cambering of the blade, which may postpone stall, create compressibility problems with an increase in forward speed and give rise to drag on the advancing blade. In the near future, the use of composite materials in the construction of rotor blades may absorb significant amounts of the torsional energy and act as a damper in the system.

As far as the pilot is concerned, corrective action to be taken when encountering retreating blade stall or dynamic stall are essentially the same and may be found in the appropriate model NATOPS manual:

- A reduction in collective will immediately reduce the angle-of-attack and lessen the stall effect.
- A reduction in airspeed will also alleviate the stall by allowing the retreating blade to operate at a lower angle-of-attack. (Since aircraft nose pitch-up is symptomatic of stall on the retreating blade, a slight reduction in collective pitch should give a smooth and coordinated level speed change.)
- If the stalled condition is the result of a high-G maneuver, a reduction in the severity of the maneuver will lessen the stall effect.
- Descent to a lower altitude, if possible, will enable the rotor to operate at a lower angle-of-attack in the more dense air; however, range may be reduced in some cases due to higher parasite drag.
- An increase in RPM, if appropriate, would alleviate the stall, but drag rise penalties may prove prohibitive.

The use of pilot comfort and control system feedback should be an effective guide to the extent of dynamic stall present. If the stick is shaking, it is obvious that the pitch links and bearings are experiencing substantial loads. Severe airframe vibrations and nose-up pitching tendency are good indications of blade stall with the associated power losses and accelerated component wear. All pilots should anticipate blade stall and its consequences so that immediate corrective action is possible.

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2. Ham, Agard, *Manual on Aeroelasticity,* Vol. III, Chapter 10.

The article entitled "Good Grief!" in the SEP '76 issue of APPROACH brought to mind a similar night carrier landing incident which occurred on my last cruise. I'm sure other carrier aviators can relate to this tale; I hope all concerned with carrier ops can benefit from it. Nobody got hurt, but it was a real . . .

Nighttime eye-opener

By LT Bob Knapp
VF-191

TWO F-4s were launched off USS BOAT for a 2-hour air intercept hop. The mission was uneventful, and both aircraft returned overhead for a Case III night recovery. Weather was good, but there was no visible horizon. After check-in, both aircraft were assigned Marshal instructions and told to use the plane guard's TACAN, since the carrier's TACAN was inop. Though the plane guard's TACAN was intermittent in azimuth and DME, both aircraft were able to proceed to their respective Marshal positions. Neither aircraft had an operative nav computer or ADF.

The lead aircraft pushed over on time with a fuel state of 5.3. Bingo fuel for F-4s was 3.7. Although the lead experienced directional gyro problems at this point, with the assistance of Approach he was able to get lined up on final and achieve SPN-42 Mode II lock-on at 6 miles. The approach was continued on the needles, but the LSO gave the *Phantom* a technique waveoff. Fuel state on the go-around was 4.7.

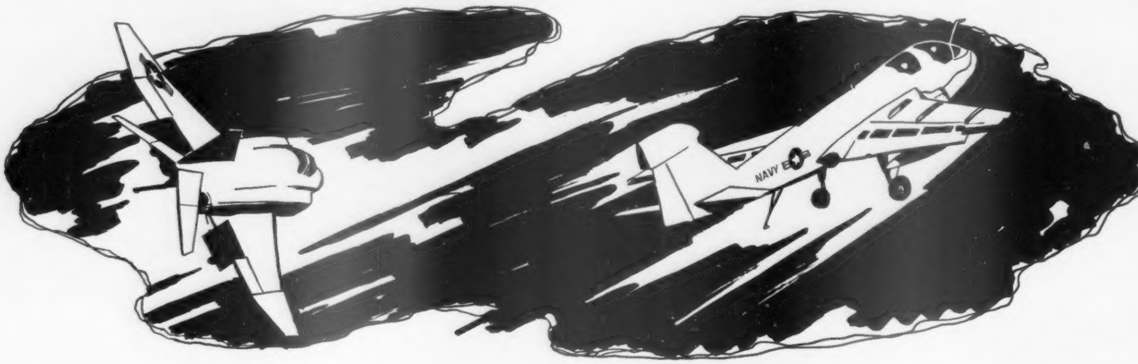
The wingman, meanwhile, had commenced a minute behind lead, dirtied up at 8 miles on final, but had unsafe gear and flap indications. The pilot requested a fly-by near the LSO platform for a visual gear check. This was approved by Approach, and they cleared him to continue the CCA. Simultaneously, the CATCC officer passed word of the *Phantom's* gear malfunction to "paddles," but the LSOs were unaware that the wingman was going to make a low pass for a visual check. To complicate things, the F-4 pilot, preoccupied with his emergency, did not fly the CCA profile. Instead, he recycled his gear and flaps in an attempt to get a down indication while maintaining his altitude. As a result, the wingman accelerated and arrived at the ramp simultaneously with the lead *Phantom*. In concentrating on the lead aircraft, none of the LSOs noticed the wingman approaching the port side of the ship at 1000 feet. The end result was that both aircrews ended up approximately one-half mile ahead of the ship, on the gages, attempting to transition to the night bolter pattern.

The lead aircraft was cleared downwind by the CATCC supervisor. Turning downwind at 1200 feet, the lead saw his wingman flash by underneath his aircraft at an estimated clearance of less than 20 feet. Simultaneously, the wingman caught sight of his lead as he was closing on his tailpipe, and pushed over excitedly to avoid a collision. The wingman recovered at 400 feet, but, somewhat flustered, elected to bingo. His subsequent field landing, after a visual gear check, was uneventful.

Exciting times were not over for the lead F-4, however. He entered downwind and reported abeam with a 4.1 fuel state. Approach control issued the F-4 vectors for base leg and turned him inbound to final bearing at 6 miles astern. The F-4's interval was an EA-6 on final, 2 miles ahead.

Somewhere between base and final, communications from the ship ceased. With no navaids or traffic advisories from CATCC, the *Phantom* crew commenced a self-contained radar approach. Approximately 3 miles aft of the ship, the pilot started down from 1200 feet. By now the EA-6 was receiving final control 1½ miles ahead of the F-4 on the alternate approach frequency. Unnoticed by the final controller, aircraft separation was rapidly decreasing due to the F-4's higher approach speed. The approach controller, monitoring his search radarscope, recognized the closure and told the EA-6 twice to elevate to 2000 feet. The final controller (a trainee) did not hear these calls since the intercom with the approach controller was inop and

Carrier night work is an extremely demanding evolution that requires extensive coordination of people, equipment, and facilities. When every one of these operates in an optimum fashion, a smooth, expeditious, and safe recovery will result.



under repair during the recovery. He proceeded with glide slope directives to the EA-6 pilot, who continued the approach.

At 1 mile aft of the ship and approximately 1/4 to 1/2 mile behind the EA-6 (which the *Phantom* pilot could not see due to its position below his nose), the pilot of the F-4 requested glide slope assistance from paddles since neither SPN-42 or -41 information was available. The LSO told him to "start it down, you're high," and the EA-6 pilot, now on the ball, was waved off. Almost immediately, the *Phantom* pilot saw the EA-6 pull up into his view. Confused, he continued his approach – until he hit the jetwash from the waved-off EA-6.

The turbulence threw the F-4 into a 60-degree right wing down attitude and caused the *Phantom* to settle below the flight deck before the pilot regained control. Selecting afterburners, the F-4 wallowed over the ship's island structure. His state was now 2.4, 1300 pounds below bingo!

The F-4 aircrew immediately switched to departure frequency and requested an expeditious tanker rendezvous. Though some confusion ensued as to the tanker's exact location, the F-4 ultimately plugged (with 1700 pounds remaining) and took on 2000 pounds of fuel enroute to the divert field.

What lessons can be learned from this close call that nearly produced not one but two midairs? Carrier night work is an extremely demanding evolution that requires extensive coordination of people, equipment, and facilities. When every one of these operates in an optimum fashion, a smooth, expeditious, and safe recovery will result. When the factors start breaking down, however, you have near disasters such as this. Consider what investigation into this mishap revealed.

The carrier's TACAN was down, and the substitute TACAN was intermittent in azimuth and DME. The ADF was reportedly unreliable at close range, and it was not possible for any airborne F-4 aircraft to use the SPN-41/ILS system. Thus, a heavy burden was placed on approach controllers to vector aircraft and provide navigational direction, when ordinarily the aircraft would have been able to handle the majority of the approach unassisted.

The SPN-43 search radar is ineffective in tracking aircraft targets within 1/2 to 1/4 mile of the ship. Thus when the two F-4s arrived overhead the ship simultaneously, they were in a blind cone and could not receive positive radar separation from each other. That they arrived in this cone together can be attributed to two things. First, the pilot did not fly the CCA as requested by CATCC. The pilot cannot really be blamed for this, however, as he was preoccupied with troubleshooting his landing gear problem. The second factor was the controller's failure to monitor closure rate between the two aircraft after he had instructed the pilot to "fly the normal CCA." Here also, the controller cannot be severely criticized since he had other aircraft to control and he had the right to expect the pilot to fly in accordance with his instructions. An informative call from the wingman alerting CATCC that he was deviating from the approach would probably have caused the controller to monitor the closure and thus prevented the first near-miss.

Normal interconsole communications between the SPN-43 approach controller and the SPN-42 final controller were inoperative from the start of the recovery. This led to confusion as to who was really controlling the EA-6 on the F-4's second approach. When the approach controller told the EA-6 to "elevate to 2000 feet," while the final

controller continued with glidepath information, confusion had to exist. The final controller's failure to pick up the closure rate must be attributed to his inexperience.

Air Ops should have ensured the airborne tanker was hawking the F-4 on his second approach in the event of waveoff or bolter. The fact that the F-4 plugged the tanker 2000 pounds below bingo is a perfect example of how quickly circumstances can degenerate into *extremis* situations.

Admittedly, to review an incident and identify all the things that should and should not have been done has only limited effectiveness in preventing similar incidents in the future. Age-old problems such as material failures, personnel shortages, training inadequacies, supervisory shortcomings, and just plain human error all transpire to prevent an easy solution to problems that are identified. What, then, can be done? Is the situation one that we must accept, and simply hope that near-misses don't become accidents? Of course not. But preventive measures must come from everyone involved in the carrier landing evolution.

From a pilot's standpoint, vigilance is the keyword. Recent trends in naval air training have led to excessive reliance by new pilots on "that voice from the ground." As is indicated by this tale, that voice on the ground is not infallible. It is incumbent on aircrews to maintain their own "big picture," analyze every action they are about to undertake, and in general, fly defensively.

Problems associated with night recoveries are by no means limited to controllers. Although not a factor in this accident, pilots who leave Marshal late/early, who don't adhere to the profile airspeed, or who fail to respond to CATCC instructions in a timely fashion set the stage for further complications and difficulties. And remember, every bolter makes the night situation more complex, as the errant aircraft have to be fed back into the pattern.

Finally, the ship and air wing must be realistic about their capabilities. If the ship has a significantly degraded capability because of equipment failure, weather, personnel, or whatever, alternatives must be considered. A cancelled launch, a smaller launch, bingos, or diverts are all alternatives that may be necessary from time to time. The value of the mission needs to be weighed against the risk involved, and then a responsible decision must be made.

Night carrier operations will never be easy or free of risk. However, responsible decisions by operational commanders in conjunction with professional performances by ship/air wing personnel can go a long way in reducing the hazards.

TREND ANALYSIS

		Discrepancy	Signoff
Day 1	Gripe 1	Unable to beep No. 2 engine down using normal engine control actuator beep trim.	Checks good.
A few days later	Gripe 2	Unable to get max beep on No. 2 engine.	Rerig the ECL.
2 days later	* Gripe 3	No. 2 actuator or beep trim inoperative (70% torque on No. 1 engine/40% on No. 2).	Recalibrate torque transducer. *(Howzzat?)* Checks good.
Still later	Gripe 4	Operational check of No. 2 actuator is needed.	Actuator in rig.
Finally Total 21 days	Gripe 5	No. 2 engine would not go to full power and won't match No. 1.	Remove and replace No. 2.

* The pilot, after the third gripe, warned the next pilot of the aircraft of the unresolved gripe. Otherwise, the helo would have been scheduled for a heavy lift (OAT 25°C) from a ship, where max beep was MORE than just nice to have.

A HAIRY CROSS-COUNTRY

THE crew of an H-46 launched on a VFR cross-country flight to a destination about 90 minutes away. They proceeded on their filed route. After clearing the control area, they filed an estimate to their destination with Homeplate tower.

Their route was over mountainous terrain, and they flew at less than 1000 feet AGL. About 5 minutes after departure they ran into lowering clouds and descended to 500 feet to remain clear. In doing so they lost communications with everyone.

Approximately halfway to their destination they were flying at 200 feet AGL and noted that up ahead the clouds went down to the deck. They did a 180 to find another low-level route but none was found. They then found an area with broken clouds and climbed VFR (?) to on-top.

They broke out at 10,000 and resumed course toward their destination. Their navaids consisted of one ADF (very weak), one UHF/ADF homer (no stations to use), and an inoperative TACAN.

A few minutes later, with 1 hour of fuel remaining, they were between a rock and a hard place. They had no communications, no ADF station in range, and bad weather below and ahead. It came to them that maybe it wouldn't be a bad idea to return to Homeplate. So they then reversed course.

Homeplate Center came booming in when the HAC gave a call and requested vectors, but they were out of range, or Center couldn't find them, or something. Anyway, there weren't any vectors to be obtained. Center called them again and requested them to switch to GCA. There was no joy with GCA, so the HAC switched back to Center. For the next 10 minutes there wasn't any communication with Center either. The HAC put the helicopter into orbit while trying to recontact Homeplate.

In the cockpit, both pilots' attention was attracted to the low-level fuel light which illuminated. There were 300 pounds in each tank. An emergency call was made, in the blind, but no station answered. When the fuel registered 250 pounds per tank, and communications had not been reestablished, and the undercast remained solid, the pilots decided to descend. The HAC wanted to land with power.

They descended IFR and monitored the radar altimeter which was reading about 4000 feet AGL when they entered the clouds. At 3000 feet AGL they found a thin spot in the clouds and could faintly see the ground. The helo pilot used the light area to advantage and descended, almost autorotating, until he broke out below the undercast at 1000 feet AGL.

After they were back in contact conditions, their fuel gages read 200 pounds, and they made a routine landing on a closed portion of a highway. Before securing the power they talked to a friendly airborne pilot, reported their position and needs, and a couple of hours later some natives arrived with fuel. The crew spent the night in their helo. The next day, in clear weather, they returned to Homeplate.

Their original flight plan had the following weather data on it: destination 1500 scattered, 8000 broken, 4 miles, winds 060/15, scattered thunderstorms enroute. Needless to say, the actual weather enroute was considerably different.

The CO pointed out that all of the mickey mouse could have been avoided if they had reversed course when they couldn't maintain at least 500 feet AGL, or even if they had reversed when they reached the point where the clouds covered the peaks.

When the HAC climbed through IMC to on-top and later when he descended through IMC, he busted a primary rule of VFR flight.

Pilots should not have to be reminded that adherence to rules and regulations essential to safe flight operations is mandatory; and along with it they must exercise sound judgment.

SILENCE ERROR

By Capt B. J. O'Donnell, USMC
Reprinted from 2nd MAW *Hot Dope Sheet*

AFTER each aircraft accident, the mishap board works to determine the causes of the accident. We are all familiar with most of the terms that label the causes: supervisory error, maintenance error, and pilot error. All accidents can be traced to some form of error at some point between design conception and the accident, and these labels are the ones we come to expect and accept. There is another very pervasive form of error that contributes to accidents but is never labeled and mentioned in the accident report. For lack of a precise label, let's call it silence error.

As aviators, we all value the opportunity and ability to fly. Because of the premium we put on this, we sometimes become reluctant to say or do something that could jeopardize another aviator's chances to take part in this activity, which we hold in high regard. This dilemma is most acute for younger and less experienced officers whose positions in the unit have not required them to be responsible for making judgments of their fellow aviators. However, this dilemma is not confined to the first tour aviators; the older and bolder types also fall prey to the error when an action does not fall under their immediate purview. They don't have time or they exhibit disdain for the views of the less initiated.

The silence error is pervasive and very subtle, because any single act of silence seems so insignificant. Like any other accident cause, though, it quietly can establish a chain of events that collectively creates a tragedy. For example, take a young aviator who exhibits good ability and judgment with his seniors, but who demonstrates an affection for unauthorized flight maneuvers to his peers. Because of this, some of the copilots express a reluctance to fly with the man and maneuver quietly to avoid doing so. Consequently, the man continues along oblivious to his problem, as do his seniors, because nobody spoke directly to either party.

Later, when this man is involved in an accident resulting from several circumstances, the mishap board determines the probable causes, which include most of the standard errors. The silence error is not included in the accident report, but the specter of it looms large. Perhaps if one of his peers had confronted him with their reservations about his actions, there might have been an extra margin of consideration. Had his seniors known, he might not have been involved in the circumstances leading to this accident, but nothing was said on either level, and the stage was set.

The effectiveness of a safety program is very difficult to measure, and there are a wide variety of elements and yardsticks. A key element is awareness, and a key yardstick is involvement. For safety to be more than just lip service, we must be involved in making people aware of hazards even when they involve the individual's shortcomings. To remain silent is the easy way out, but in the end it is a disservice to ourselves and a silent but glaring error. To make a safety program work, we must all be ready and willing to communicate with each other on an open and direct basis.

Anymouse

The "Brakes" of Naval Air – Again!

THIS incident occurred while deployed on a WESTPAC carrier. The aircraft, a KA-6D, was preflighted and started normally. It was then taxied to Cat 4 and was ready for launch. However, the plane guard helo went down, and a lengthy delay ensued while a new helo was spotted and started. Anticipating the long delay, the pilot of the KA-6D set the parking brake. The aircraft was in the holdback at the time.

When the helo finally did start and launch, everyone was in a hurry to get the late launch going. Consequently, the KA-6D was put into tension immediately and, you guessed it, launched with the parking brake still on.

Both mainmounts were blown. The aircraft was notified, but the gear had already been retracted. The tanker was checked for damage and completed a normal mission when none was found. A routine shipboard arrestment was made at the normal time.

This is another example of a broken habit pattern causing a mishap. The old NATOPS checklist did not include "parking brake" as a takeoff checklist item. A proposed change does list it as a checklist item and also specifies that the parking brake is not to be set once in the holdback. Hopefully, these changes will eliminate this type of mishap.

This is not the first time an A-6 has been launched with the parking brake set. The last time it happened, the pilot ejected. A caution has been added to the taxi checklist that states parking brake is not to be set for launch delays. The takeoff checklist contains the step "Brakes – released," so between these two items, there will be, hopefully, no more incidents like this.

Who Cares?

JUST after sunset, an H-46 launched from an MCAS on a routine night familiarization and navigation flight. About one hour later, a mech informed the squadron ODO that several tools had been inadvertently left adrift on the aft pylon.

The ODO then began an immediate recall of the aircraft. However, no

contact could be made on squadron common UHF or FM. A quick check with the tower revealed the pilot was not monitoring tower frequency. The ODO called the station duty officer, explained the situation, and requested that a call be made on Guard, directing the H-46 pilot to come up on squadron common. The station duty officer (unbelievably, an aviator) then stated that air station regulations forbid the use of the Guard frequency except in actual emergencies, and that such a call was out of the question, since no emergency had been declared.

The squadron ODO then asked for the phone number of the air station operations officer. The station duty officer declared that local instructions forbid giving the ops officer's home phone. At this time, an angry ODO hung up and was about to call his CO when the pilot of the H-46 called in on

The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. These reports need not be signed. Self-mailing forms for writing Anymouse Reports are available in readyrooms and line shacks. All reports are considered for appropriate action.

**REPORT AN INCIDENT
PREVENT AN ACCIDENT**

squadron common for a weather check. He was advised of the potential danger and requested to return immediately. He landed without mishap.

I wonder if regulations are made to assist or hinder? And I wonder about officers who use no common sense but blindly follow a piece of paper which couldn't possibly allow for every contingency.

Catch-22-mouse

A Downing Gripe

RECENTLY, while I was a flight crewman in Japan, I took a flight to Korea. The trip to our destination was uneventful and everything went smoothly. However, on preflight for our return, I found two hydraulic leaks. When I told the aircraft commander the plane was down but that I could have it fixed in 4 hours, he said to fix it.

Then, with no apparent reason, he changed his mind and told me to get some extra hydraulic fluid and we'd fly it back. I argued with him for an hour and pointed out that the aircraft was unsafe to go with the leaks.

We took off, and about an hour and a half later, we began losing hydraulic pressure. When we added more fluid, the pressure still continued to drop. I told the AC about the problem and he replied, "I didn't think it would last *this* long." When we reached land, we had no pressure at all, which meant we had no brakes, flaps, or windshield wipers.

We made a routine landing approach, but we sure used all 9000 feet of runway before the aircraft stopped. We were lucky, and I thank God we made it safely.

Frustratedmouse

If someone could figure out a way to keep pilots from taking stupid chances like this, naval aviation in particular, and all aviation in general, would be better off. As Abby or Ann might suggest, show this to your friendly ASO and ask if it could happen in your outfit.

Re "Look What's New!"

THE article "Look What's New!" on the inside back cover of the SEP '76 issue of APPROACH appears to contain not only a neat idea for the location of a P-3 performance card, but also is perhaps a breech of security. I'm really not sure, but I suspect that any photo which shows any part of a classified fire control system is classified – or at least "For Official Use Only." I'm sure that VP-17 is really enthused about this nickel-dime suggestion, but I really wonder if it was necessary to show for all to see what the P-3 weapons system capabilities are.

Concernedmouse

Fear not. The same panel is in the unclassified section of the NATOPS manual, and when the aircraft is on static display, it is not covered up.

Aviators' Flight Equipment

ONE morning last fall (and at least twice before that), I observed a pilot (0-5 type) flying one of our helos without the required personal flight equipment set forth in NAVAIR 01-11OHCE-1. He was dressed in short-sleeve khakis and low-cut *Corfam* shoes. The only required items he wore were a protective helmet and *Nomex* gloves.

I think if safety officers briefed all pilots on the regulations for proper attire and equipment for flight, and if you published something about this problem in APPROACH, the problem would disappear.

Flightequipmentmouse

Confucius says: "Pilot who flies without full bag doesn't have full bag."

If you blew a tire on takeoff like this F-14, have you decided in advance at what speed you would abort or continue?

Have you made up your mind?

By LT D. L. Sturgeon
NARU Alameda

IF you're looking for an idea to get some lively discussion going, try this. Ask a group of aviators "What would you do with a firewarning light at rotation speed?" You're likely to find a range of answers, all the way from "abort" to "eject." The point is, if these type of decisions aren't made way ahead of time, or at least carefully considered, the consequences could be disastrous.

Any number of emergency (immediate) decisions might have to be made during the takeoff roll. Have they been thought out? A recent Air Force publication, *Aerospace Safety* (Oct '76), discussed an interesting and workable way to see if its readers had thought out the alternatives. The accompanying table (similar to the one used in the Air Force article) was distributed at a local squadron safety standdown. Each crewmember decided (under only the pressure of the readyroom) what he would do – abort, continue, or eject – in a variety of takeoff situations. The answers were compared, and the results are in the table.

Scenario: You are in an 11,500-pound TA-4J with 8000 pounds of fuel. There's no wind as you take Runway 31 (8000 feet) for takeoff at 2200 local. Temperature is 15°C, the runway is dry, and the weather is 1300-foot overcast with 7 miles visibility. The long-field arresting gear is rigged 1600 feet from the end of Runway 31. Your planned takeoff roll is 3600 feet with a takeoff speed of 152 KIAS. Refusal speed is 93 KIAS, stopping distance is 4400 feet, and the line speed check for 2000 and 3000 feet is 119 and 143 KIAS respectively. What would you do – abort, continue on takeoff, or eject – given the situations depicted in the table?

In some situations, there was unanimous agreement to abort or to continue the takeoff. However, when the speed gets up near rotation velocity where the decisions have to be made instantly, the disagreements came and the discussions began in earnest.

The exercise was not designed to preach right or wrong on the question of aborting or continuing the takeoff. There are obviously gray areas not covered in NATOPS, and what might be correct in one situation might not be in another. What is accomplished by such an exercise is to get each individual to think "What would *I* do in this situation and why?" Perhaps some decisions were changed during the ensuing discussions, perhaps not. At any rate, the possibilities of having to make a critical decision were considered, and that little bit of preplanning just might make the difference one day.

	Noticed at 95 knots	At 2000 feet	At 3000 feet	Rotation at 145 knots	At liftoff
Firewarning light – ON	A - 6	A - 6	A - 3	A - 3 C - 3	C - 6
Fuel boost warning light – ON	A - 5 C - 1	A - 5 C - 1	A - 4 C - 2	A - 1 C - 5	C - 6
Canopy unlocked light – ON	A - 6	A - 6	A - 6	A - 2 C - 4	C - 6
Engine chugs	A - 6	A - 6	A - 6	A - 4 C - 2	A - 1 C - 5
Suspected blown tire	A - 5 C - 1	A - 5 C - 1	A - 2 C - 4	C - 6	C - 6
Noticed flaps up	A - 3 C - 3	A - 3 C - 3	A - 1 C - 5	A - 1 C - 5	C - 6
Low oil pressure, below 20 psi	A - 6	A - 6	A - 6	A - 2 C - 4	A - 1 C - 5
Fluctuating RPM, fuel, flow, EGT	A - 6	A - 6	A - 5 C - 1	A - 5 C - 1	A - 1 C - 5
Smoke in the cockpit	A - 6	A - 6	A - 5 C - 1	A - 3 C - 3	C - 5 E - 1
Tower calls, "SG01, you have smoke underneath your aircraft"	A - 6	A - 6	A - 5 C - 1	A - 2 C - 4	C - 6
Elevator trim runaway noseup	A - 6	A - 6	A - 3 C - 3	A - 1 C - 5	C - 6 C - 6
Loud thump – no other indication of trouble	A - 6	A - 6	A - 4 C - 2	A - 1 C - 5	C - 6
Utility hydraulic ladder light – ON	A - 6	A - 6	A - 4 C - 2	A - 1 C - 5	C - 6

Numbers indicate responses of the test group.

A = abort
C = continue
E = eject

Personality characteristics of the high-accident risk naval aviator

IS it possible to predict which naval aviators are more likely to have accidents than others? This is a question that has plagued aviation psychologists, flight surgeons, and commanding officers for years. Obviously, to be able to identify high-accident risk naval aviators and then weed them out of the program (or prevent them from entering) would be of great benefit to naval aviation.

Captain Roger Reinhardt, a retired Navy flight surgeon psychiatrist, described the personality profile of the accident-prone aviator as action oriented with a strong moral upbringing, resulting in a strong conscience. He places great importance on how he appears to others, and he has recently assumed new major responsibilities. The symptoms of the "accident process" are manifested by setbacks in all areas of living: personal (i.e., divorce), social, and professional. He senses something is wrong, and his actions are frequently disguised pleas for help. There is some evidence that accidents among such individuals are not completely unplanned or unintentional on the subconscious level. Many express guilt and anxiety and feel they deserved the punishment of an injury immediately following an accident, although they deny these feelings later. Some researchers believe these characteristics render an individual less able to cope with stress, and the combination makes him doubly accident-prone.

A study of individuals who take unnecessary risks in

By Robert A. Alkov, Ph.D.
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sports or professional duties suggests a defense pattern known as the counterphobic personality. The individual who experienced intense childhood fears (phobias), such as a fear of flying, sometimes develops a method of handling such fears through exposure to the fear-producing environment. This defensive mode of countering one's fears through familiarity with them may develop pathologically in adolescence and adulthood. The counterphobic defense pattern serves the individual to prove to himself that he really is not afraid. The thrill of seeking out feared experiences and surviving, even mastering them, reinforces this counterphobic attitude. It is considered pathological when unconscious reassurance is sought in a compulsive and recurrent manner. This type of ego defense mechanism is called "denial." Denial may prevent a pilot from realistically appraising the dangers involved in aviation. In seeking out danger, the individual becomes an accident risk.

Case History. A search for high-risk aviators led to a behavioral analysis of fatal pilot-error aircraft accidents in the U.S. Navy during fiscal years 1975 and 1976. A 43-item "Recent Life Changes" questionnaire, developed by Dr. Thomas Holmes of the University of Washington and Dr. Richard Rahe of the Naval Health Research Center, San Diego, was sent to squadrons for completion by peers or family. A dozen pilot error accidents during this time involving pilots whose personalities resembled those described by Reinhardt were identified from the completed questionnaires and from Medical Officer Reports of aircraft accidents. All save one of these flew into the ground or water. Ten of them occurred during daylight visual flight conditions and were due to flight violations on the part of the pilot (one of these was suspected but not proven). Nine were flying fighter or attack jet aircraft, one was flying a high-performance turboprop reconnaissance twin, and two were flying helicopters (one of these was a

high-performance attack helo).

A composite-fictionalized but typical case history based on actual accidents is summarized below.

A 27-year-old Navy lieutenant flew an attack aircraft into the ground on a low level tactics training mission, although he had been repeatedly warned about flying too low. There was no ejection attempt, and the pilot was killed instantly on impact.

An investigation of his background revealed he was from a rural family. His upbringing was relatively strict regarding religion and morals. His authoritarian father demanded a high level of performance from him in school and in chores. His father was a World War II aviator. When he was 7 years old, his father took him flying in a light aircraft. He was petrified at the experience, according to his mother.

A graduate of the Naval Academy, he finished near the top of his class in flight training. He was described as aggressive, active, impulsive, adventurous, and highly motivated for aviation. Although he resented authority himself, he was a rigid, compulsive, demanding perfectionist in his flying and with subordinates. In his social life, however, he was a heavy drinker, gregarious, and tried to be the center of attention. He considered himself somewhat of a "lover." Many felt that he used people.

In his flying, he was considered a good pilot, and he knew it. He was overconfident and seemed to have an overwhelming ego. He impressed his flight instructors with his aggressiveness and skill, although on several occasions he was graded poor in headwork (judgment). He was known to violate NATOPS and had been grounded twice for violations since reporting to the squadron. He had argued with his skipper on several occasions concerning flying regulations which he considered to be restrictive. (The skipper secretly admired him because he reminded him of himself when he was a first tour aviator.)

Until recently, things had pretty much gone his way. He enjoyed the fast and free bachelor style of life, driving fast sports cars and motorcycles. Then, in rapid succession, he lost a close, personal friend in an accident, and his fiance broke off their engagement. He had gotten into debt and argued bitterly with his father on a recent trip home on leave. He was notified that his father had a severe, but not fatal, heart attack after he returned from leave.

Due to these recent life changes, he was depressed and seemed to have developed a fatalistic attitude toward death. He became fascinated with risk-taking. He started hang-gliding and sports parachuting. He accumulated several speeding tickets and started to drink more.

His ex-fiance described him as self-centered, narcissistic, with grandiose ideas about his glamorous self-image and a strong desire to live up to that image. He had to be the best in everything he did. She also stated that he was reluctant

to admit error and that he refused to grow up, but acted impulsively.

Personal factors in the 12 case studies from which this composite was drawn emerged through the efforts of conscientious flight surgeons who probed beyond the usual human factors data reporting system during aircraft accident investigation. It may reasonably be presumed that there were many more cases that were not reported because:

- The mishap was not severe enough to engender this type of background analysis.
- A qualified, motivated flight surgeon was not available.
- The pilot survived, and in an attempt to salvage his career, a coverup was instituted by him and his squadronmates.
- Much of the information is not forthcoming from bereaved family members. (Many flight surgeons are hesitant to ask personal, sensitive questions under these circumstances.)
- Commands suppress such data to forestall criticism of their crew surveillance and supervisory procedures.
- The pilot was new to the squadron, had no family, and no one knew him well.

In spite of the difficulty in defining the magnitude of the problem, these cases reveal a pattern of personality deviation which has been costly to the U.S. Navy in terms of lives and aircraft destroyed. Looking for a thread of commonality in these cases, the characteristics of excess aggressiveness coupled with immaturity or impulsivity seem to leap out. These are the reputed characteristics of the risk taker. These individuals were generally good stick

and throttle pilots during flight training, but seemed to lack the quality of judgment, according to their instructors.

A composite profile of these pilots reveals an individual who is an egocentric perfectionist with a high opinion of himself. He is resentful of authority, who he feels puts unfair restrictions upon his superior performance. He portrays himself as a sociable extrovert, the "life of the party," and a "ladies' man." He has low tolerance for tension, is less in harmony with his environment, and drinks too much. He feels he is above ordinary mortals and lives (and dies) by his own rules.

Much of his behavior consists of acting out the role of the archetypal "hot" pilot fostered by movies, novels, and television. His model is a fictional, feisty character out of an old John Wayne movie. He sees himself as an overly aggressive barroom brawler and two-fisted drinker. Tragically, this sometimes leads to a pattern of behavior associated with alcoholism, divorce, depression, and accidents.

Unfortunately, the system fosters this type of role playing. The traditions of aviation, *esprit de corps,* and camaraderie among aviators create pressures on the impressionable to live out some of the tall tales told at the "O" Club bar. These same pressures seem to induce some pilots to drink too much and to attempt flying while fatigued and suffering from hangovers. The aggressive and gregarious young aviator who is successful at living out the hero image impresses his flight instructors with his skill.

This recognition reinforces the individual's own self-appraisals as a "hot" pilot. He falsely associates his flying ability with this masculine image model. Being ego-involved, he is overly sensitive to criticism of his flying skill. Furthermore, he tends to confuse fitness to fly with ability. This is especially true of psychological fitness to fly. Any attempt to suggest that he is not prepared to fly, other than an obvious physical problem such as a cold, fever, etc., will evoke a defensive response. Thus, he normally will not seek help from within the naval community, but frequently his actions could be seen as a disguised plea for help (i.e., flight violations in the company of a superior).

The egocentric individual, successful in the past, develops a "golden-haired boy" syndrome. He comes to feel that he can do no wrong and will always be able to command events in his life. When things start to go awry, his self-confidence is badly shaken. His typical ego-defense pattern is denial. He denies that he is getting older, that he is not the world's greatest lover and pilot, and that he too is mortal. His actions go beyond denial to a counterphobic behavior in which he repeatedly takes unnecessary risks as if to prove to himself that he can still cheat death. When he narrowly escapes through his own skill, he feels euphoric.

On the ground, he feels out of harmony with his environment. He may undergo a personality change and may start letting his nonflying duties slide. His desk work will pile up while he tries to get as many flying missions as possible in order to engage in thrill-seeking behavior to alleviate his boredom.

Ironically, many of the characteristics of the high-risk naval aviator are also the characteristics of the best tactical pilots in the Navy. The good naval aviator will characteristically display aggressiveness, confidence in his ability, and a desire to be second best to no one. He enjoys the camaraderie of naval aviation, the *esprit de corps* of the squadron, and he can hold his own swapping sea stories at the "O" Club. The difference, however, between the type of pilot we want in the Navy and the high-risk aviator is discipline and judgment. The good naval aviator knows his capabilities and his limits. He knows his aircraft's capabilities, and he flies it to its limits – but not beyond. He realizes that he must be psychologically and physically fit to perform the demanding tasks required of him in the best fashion. In summary, the good naval aviator approaches his flying in a professional manner. The naval aviator we want today must be a team player who can cooperate with and coordinate the efforts of other crewmembers, wingmen, and ground tactical controllers. These complicated systems demand an aviator's nonflying hours be spent studying operations and tactics manuals, and his off-duty hours not be spent exclusively drinking and swapping tall tales at the local "O" Club.

Although we still have some of the high-risk personality types in naval aviation, fortunately, they are getting to be fewer. This type of individual may have been desirable as a movie hero model during World War II in the style of a currently popular TV series. This was great morale-building propaganda during wartime. But the F-4U has given way to the F-14, completely changing operating procedures and increasing demands on the pilot. Perhaps we should relegate our World War II movie and TV heroes to the tube and realistically make way for a whole new breed in naval aviation – the new professional.

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A Modular Approach to Safety

By LCDR J. J. Johnson
VF-32 ASO

TRAINING and safety are virtually inseparable. The pilot that launches for a mission that he has been well prepared for is far less likely to have an accident than the pilot who attempts the mission without sufficient buildup and experience. A pilot must train systematically and progressively to ensure he is capable of performing the mission at hand.

Unfortunately, all too often a squadron's training plan is not systematic or progressive. Training is accomplished with little preplanning and with no long range goals or schedules to ensure that all areas are covered before the demands are placed on pilots. Moreover, there is often no continuity to the training plan to ensure that pilots who come in at different times in a squadron's cycle pick up the training given earlier.

VF-32's answer to the training problem is the modular approach to training. In naval aviation there exist certain functions which can be generally categorized by groups. In the fighter community, we have set up the groups as depicted in Fig. 1. These standard operating groups will be the same for many squadrons. Others, such as the VP community, could use the first four groups and then establish their own warfare specialties in lieu of those unique to the fighter community (intercepts, ACM, etc.). If we consider each of these groups as a module, with its attendant problems and safety requirements, we then have a modular concept approach to safety.

The modular approach to training offers many advantages. Different levels of training can be conducted at the same time using different modules. The module appropriate to the upcoming operational requirements can be selected to ensure the aircrews are prepared. The modular approach builds on past experience to encompass all important training and safety prerequisites for any given area. And the training can be flexible with this approach.

Let me illustrate. In VF-32, the modular concept was formulated and the master cycle begun upon return from deployment. Basic Training began for new aircrews, and General Flying was selected for the second-cruise types. Shortly after this training had begun, we received a requirement to send a number of aircraft and aircrews to a carrier for an unscheduled at-sea period. The FCLP module was used for reference, and training was immediately shifted to this phase for the aircrews involved. The Carrier Qualification module was studied for the next operation after FCLP. When the at-sea requirement ended, the aircrews returned to the General Flying module to pick up where they had left off.

In addition to a training plan, each module contains safety considerations unique or appropriate to that area. Thus, NATOPS procedures and aircraft systems are reviewed on a regular basis in conjunction with the appropriate training areas.

Although this concept has been particularly slanted toward aircrew training, VF-32 is currently engaged in formulating a comprehensive safety training plan for the enlisted men. The enlisted plan consists of only two major modules – ship and shore. This is considered the basic difference in the work environment that exists for Group IX personnel, especially those who may be working on the flight deck.

Admittedly, the modular approach will only be as effective as the actual training that is accomplished. But it does provide a framework for training that provides many advantages over other long range training plans. Within VF-32, the modular approach to safety provides a checklist of items to think about and discuss as a part of the awareness process in accident prevention. Our motto is:

Readiness through safety.
Safety through awareness.
Awareness through education.

The standard operation groups currently in use in VF-32 are as follows:

A. **Basic training**
Open/closed book NATOPS
Flight physiology
Course rules
Divert fields
Seasonal weather
Simulator training in emergency procedures
Crew coordination

B. **General flying**
Area familiarization
Restricted/warning areas
Divert field info and planning
Line procedures
Bingo profiles
Touch-and-go
Formation
Crew coordination

C. **Instrument flying**
Simulated instruments
Approaches
Section approach — lead and wingman
Actual instruments
Roundrobin flights
Crew coordination

D. **Cross-country flying**
Flight planning
Servicing
Security
Daily checks
Crew coordination

E. **Intercepts**
Solo tactics
Section tactics
Missile firing
Crew coordination

F. **Air combat maneuvering**
Solo tactics
Section tactics
Unusual attitudes
Engine out
Departures
Stall/spins — prevention/recovery
Crew coordination

G. **Field carrier landing practice**
Engine out
No flaps
No speed brakes
NORDO
Waveoffs
Crew coordination

H. **Carrier qualifications**
Operations around the ship
Departure and entry patterns
GCA
MOVLAS
SPN-41/42
Crew coordination

I. **Workups**
Air wing/unit training — beach
Crew coordination

J. **Type training**
Air wing/unit training — ship
Crew coordination

K. **Deployment**
Bingos
Foreign controllers
ICAO rules
Area/national procedures
Crew coordination

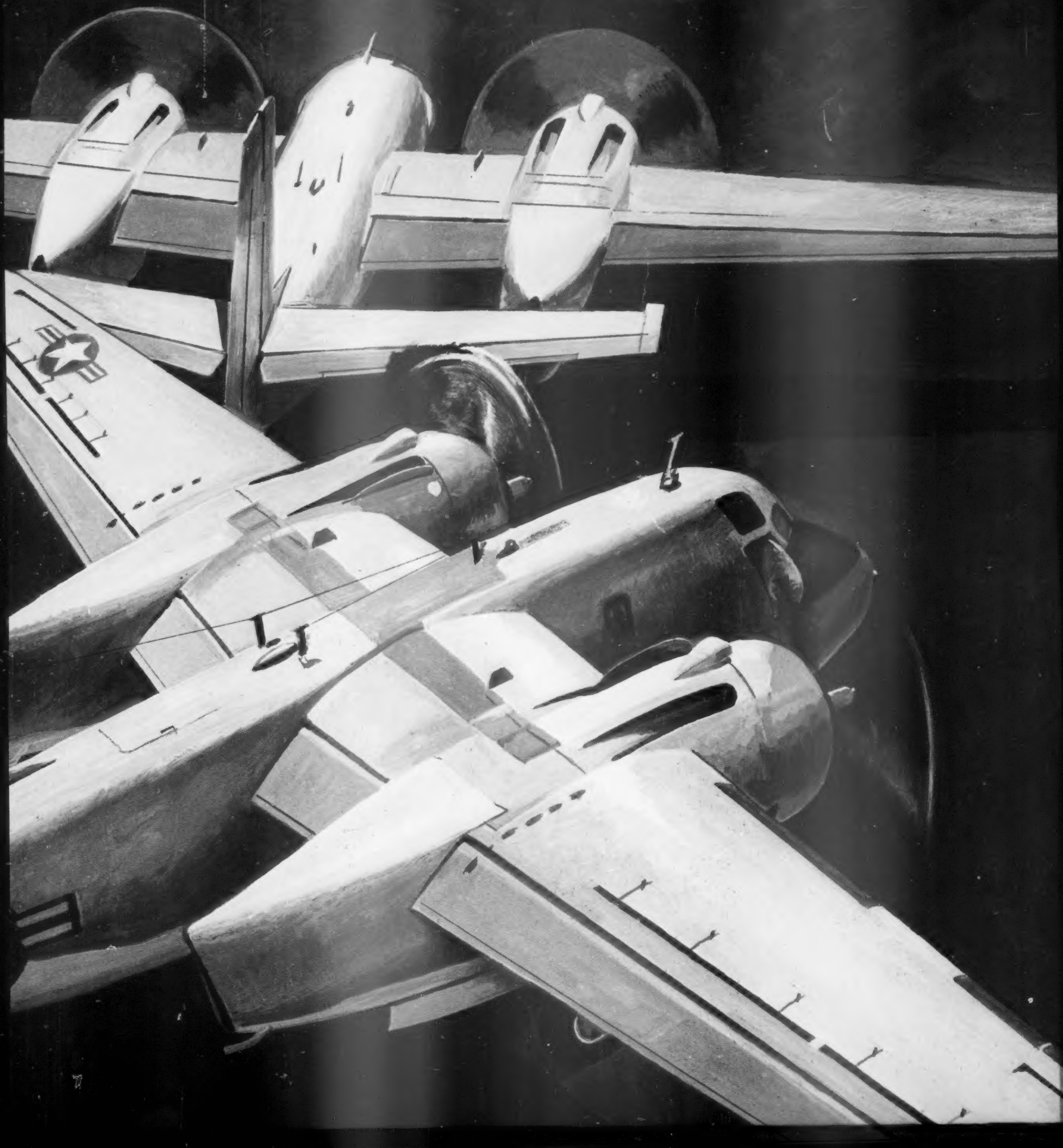
L. **Preparation for return**
Instrument qualifications
Course rules
Runway landings
Crew coordination

M. Back to module A for new aircrewmen
Back to module B for old hands

Fig. 1

About the Author. LCDR Johnny Johnson is a veteran RIO with over 2700 hours in Navy/Air Force fighters. He has been interested in promoting aviation safety and survival for years and has submitted many innovative ideas for consideration, such as three-dimensional approach control radar and floating parachute shroudlines. LCDR Johnson left VF-32 in July and is now on the staff at Naval Postgraduate School, teaching accident prevention.

A Slight Misunderstanding



CONDITIONS were just right for Snoopy to start the great American novel – it was a dark, stormy, winter night. The big CV had been operating all day, launching and recovering carquals. The time was 2140, and the seemingly endless evolutions were soon to terminate.

Everyone was dragging, but there weren't too many pilots left to qualify. Some pilots had completed and were remaining aboard overnight with their aircraft. Others had been cleared to return to Homeplate, since the ship was only about an hour off the coast.

Two C-1 aircraft from different air stations awaiting cat shots were parked on deck at a 45-degree angle toward the bow, facing the island. The No. 1 *Cod* was given a short come-ahead and then a left-turn signal to move to the catapult. However, the turn was executed with insufficient clearance between the arc of his tail and the propeller arc of the No. 2 *Cod.*

Subsequently, the starboard elevator of No. 1 passed through the turning port prop of No. 2, with the result that a pie-shaped chunk of elevator, about 6-by-12 inches, went flying through the air.

The pilots in No. 2 C-1 recognized what had happened, and one said to the other, "We've been crunched. I'm going to secure the port engine." The other pilot agreed and then began a transmission, "Tower, this is No. 2 . . . " Whereupon the tower replied, "Rog, we see it, No. 2." However, the pilots in No. 1 knew nothing about what had transpired and did not hear the conversation between No. 2 and the tower.

One of the officers in Pri-Fly took a pair of binoculars, studied the damaged elevator, and looked for any other damage. Later, after receiving a report from the flight deck, he concluded the aircraft was OK to launch.

Number 1 C-1 was taxied to the port side instead of continuing to the catapult. One of the officers on the flight deck noted that metal damage underneath appeared significant. A plane captain also went over to inspect No. 1 and didn't like what he saw. The copilot of No. 1 saw a checker on his side of the aircraft give him a signal, but didn't understand what it was. Then the plane captain entered the aircraft and informed the pilots of the damage to the elevator and asked for a control check. The pilots only heard "elevator" and "check controls" and gave a thumbs-up after rudder and elevator checks.

The plane captain acknowledged the thumbs-up and assumed the pilots understood the entire situation and that the pilots were accepting the aircraft for the flight to Homeplate. Normal communications were complicated not only by the noise of the C-1s but also by two F-4s which were turning up nearby.

The flight deck officer who had taken a quick look at No. 1 returned to Flight Deck Control and told the ACHO (aircraft handling officer) that No. 2, which had shut down the port engine, was OK and flyable, but No. 1 required repairs. The ACHO told the flight deck crew to strike No. 1 below. At this point, the plane captain told the ACHO he had talked to the pilots of No. 1 and that it checked out all right. There wasn't any damage to a strength member – just sheet metal. The ACHO then reversed himself and told the tower that No. 1 was OK to launch. In due course, both C-1s were shot off.

As No. 1 checked the 10-mile gate approaching Homeplate, all elevator trim was lost. However, the elevator trim stop and emergency circuit breakers were pulled and reset, and normal trim was restored. An uneventful landing ensued. When the pilots made a visual inspection and saw the damage, they both were shaken. When questioned about the incident, they stated that they wouldn't have launched if they had known about the prop and elevator encounter.

In summary, there was sufficient time and information available to have prevented the dinged *Cod* from launching.

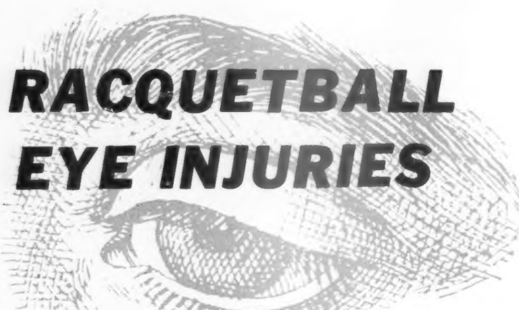
The pilot should have questioned Pri-Fly about the unusual positioning of his aircraft on the port side and the reason for the appearance of the checker in the aircraft.

Pri-Fly should have questioned the pilot about the crunch before allowing the aircraft to taxi to the catapult.

Aircraft directors must be alert and cautious to ensure adequate clearance is available before pilots are allowed to taxi aircraft.

Communications between ground personnel and pilots must be precise and leave no doubt about any situation.

A thorough and complete inspection should be conducted by squadron experts on any aircraft after a crunch.



RACQUETBALL EYE INJURIES

By Richard P. Shipman
Naval Safety Center

PUT your hand over one eye. Try to focus on a distant object. Notice how your depth perception has been degraded. Imagine what it would be like to drive a car in this condition. Or fly an airplane.

As an aviator, you rely on your eyesight even more than the average person, so you know that any eye injury or damage could result in permanent grounding. It seems obvious that you should take extraordinary precautions to protect your delicate, irreplaceable eyesight.

A major threat to this precious eyesight has arisen as a byproduct of the burgeoning popularity of racquetball and other walled-court sports. Racquetball is an exciting, fast-paced game requiring skill, endurance, finesse, and strength. It is a wonderful way for military personnel to meet new CNO physical fitness *requirements* and build aerobic points. But it is not without danger – particularly to your eyes.

While the danger to your eyes may not seem apparent, statistics indicate the danger is there. In the years 1970-76, 75 Navymen suffered eye injuries playing walled-court sports. Over a similar period of time, the Air Force suffered 285 eye injuries, including one fatality!

But it won't happen to me, you say. Just like an aircraft accident. Well, maybe not, but are you willing to make that

gamble, with your eyesight being the stakes?

There are certain things you can do to minimize the chance of getting hit in the eye with the ball. The most obvious principle is not to watch your opponent hit the ball if he is behind you. Even if you scrupulously adhere to this principle, however (and how many racquetballers would confess to stealing a glance now and then?), the chance of injury exists. How about a shot you're trying to bounce off the back wall to reach the front wall? How about a shot ricocheting off a side wall that comes faster than you can react to? The possibilities are really limitless. But don't take my word for it; just read the accident reports.

The answer to the eye protection problem is any one of a number of simple, inexpensive eye protection devices. The simplest is a pair of nonprescription industrial safety glasses. Plastic wraparound goggles are also available as is an eye guard that has no lens at all. All of them perform basically the same critical function: they keep the ball from contacting the eye.

Impact-resistant lenses in regular prescription glasses are better than nothing, but they offer nowhere near the protection of industrial safety glasses. Older eyeglasses which are not impact-resistant are of no value and can actually increase eye damage due to fragments of broken glass being forced into the eye. Also, contact lenses do not offer any protection against a blow to the eye.

You probably feel some reluctance to wear these protective devices because they restrict your vision and aren't as comfortable as going without. That may be so, but eye protective devices are easy to get used to. You got used to wearing a protective helmet while flying, and you accept all other flight equipment that is restrictive or uncomfortable because you realize it is necessary for your own safety. Why should safety glasses be any different?

Racquetball is a great sport that is being enjoyed by increasing numbers of Navy personnel. Wearing protective glasses may not make you a better player or spare you "the agony of defeat," but it will spare you the loss of perhaps your most valuable physical possession. Why take chances? Those Golden Wings mean too much.

They were young, inexperienced, and irresponsible.
They thought they were Sierra Hotel.
They are dead!

FLATHATTERS

THERE comes a moment of truth in the lives of most pilots when the urge to show off becomes very strong. The moment may occur shortly after a pilot has soloed or may be delayed until the individual has accumulated quite a few hours. However, sooner or later (with apologies to Sir Walter Scott) breathes there a pilot with soul so dead who never to himself has said, "I think I'll take it down and do a little buzz job."

The majority of pilots resist the urge because it is against regulations, it is immature, and it is dangerous. The few who give in to the urge can be divided into two categories: the lucky ones who survive, and the unlucky ones who don't survive.

If one can be objective in trying to analyze why a pilot flathats, he may presume that there is momentary exhilaration from the act. The showboat is not content to fly safely and sanely but yields to temptation to demonstrate he's the master maneuverer of all time. Naturally, the hotdog disregards the fact that his showboating impresses his peers far less than a good performance at the bombing range or in ACM environment.

Let's review a not-too-old flathatting accident in which all the ingredients were present to make it a classic Delta Sierra example.

The flight was scheduled for an early morning launch with an hour's lead time for briefing. Originally it was a 2-hour FAM flight for the pilots with an additional requirement for the crew to be on airborne standby for another event. The pilots had been briefed to remain within communications range of Homeplate.

After filing, some passengers showed up and the spokesman said, "We were told to report for a local training flight to see what the local area is like." The oncoming duty officer was consulted, and he claimed no knowledge of the requirement. However, the offgoing duty officer confirmed it had been approved, and the flight was changed to suit the passengers.

The passengers were accepted, escorted to the aircraft, and thoroughly briefed while strapping in. Engines were started, and the pilots taxied out for takeoff. Immediately after takeoff, the pilots proceeded to a nearby training area and began low-level maneuvers. They alternated turns and altitudes, depending on the terrain.

After many passes, playing hide-and-seek behind some hills, the pilots would pop up over a hill and simulate an attack on an imaginary target. A couple of the passengers became nauseated. The pilots were advised and returned to base to offload the sick ones. Only one got out; the others decided to stay with the aircraft.

The pilots refueled while on the deck, in case they were

needed for another mission. They then became airborne, returned to the training area, and were observed continuing their zooms and climbs. After a particular dive, they did not recover and spread bits and pieces of the aircraft over a wide area. Miraculously there were two survivors – but tragically there were many dead.

The board ascertained from their investigation, from eyewitnesses (in the training area and in other aircraft), and from the survivors that there wasn't any material failure/malfunction cause in the accident. The aircraft had no significant outstanding discrepancies; it had had all scheduled maintenance actions completed on time; and there were no trends of repeat discrepancies on the airframe or engines.

The board concluded that the pilots had no valid reason to be engaged in erratic, low-level flying. The flight had degenerated from a routine look-see type flight into a full blown flathatting show. The result was tragic.

The responsibility of the aircraft commander cannot be overemphasized. It is incumbent upon the pilot in command to ensure the safe and orderly flight of his aircraft at all times. The unprofessional and inexcusable conduct of two naval aviators in flathatting is totally unacceptable.

Most investigations turn up individuals who were aware, before the fact, that the hotdog was not professional in his approach to flying. Further, investigations usually reveal that the offender has been guilty of air discipline infractions on a continuing basis. The sad part is that those who know fail to communicate the facts to the CO or others who can do something about it. When a pilot or NFO becomes aware of a dangerous, gross breach of air discipline, he has a moral obligation to remonstrate with the person involved and bring it to the attention of competent authority.

Even one accident resulting from a senseless, unauthorized exhibition of low-level flying is intolerable. The distinction between professional aggressiveness and foolhardy action is a fine one; nonetheless, an unauthorized low-level flying exhibition, in violation of law and regulation, demonstrates poor judgment. It is not enough that we personally conduct our own duties connected with flight operations in a safe, sane, and professional manner; we have a moral obligation to refuse to lend support (tacit or otherwise) to those few individuals who would abuse the trust and confidence placed in them.

In naval aviation, we *are* our brother's keeper. Through leadership, personal example, professionalism, and friendly guidance, let's keep each other straight. The ultimate answer is for each and every aviator to exercise self-discipline and strive for professional performance at all times.

A flathat may cover a fat head

Jeremy A. was a bold DNA,
The scourge of the ether was he.
He zoomed o'er the nation without reservation,
Blithe spirit, unfettered, and free.

He showed off his skill by buzzing each hill,
Each farmhouse, each valley, each town.
His episodes shady had frightened each lady
And gent in the countryside 'round.

Evincing no care for the rules of the air,
Ignoring such constraining matters,
It was strictly the whim of the moment for him,
The flattest of all the flathatters.

He waited one day, did Jeremy A.,
To launch on a hop with J. Brown.
The yellow sheet told of malfunctions untold,
The aircraft was certainly down.

"Not me," said J. Brown, with incredulous frown,
"I ain't going up in that crate!"
"Well, *I'm* going, kid!" said A., and he did,
And the outcome we now must relate.

A. knew a chick who lived by a crick,
And decided to give her a buzz.
His rule violation caused no consternation,
He feared not the aerial fuzz.

While performing his trick for the chick by the crick,
His engine began to lose power.
At one-five-oh feet, its irregular beat
Convinced him to contact the tower.

As he started his try to get back on high,
The engine gave one final wheeze.
While he searched all around for someplace to set down,
The aircraft met up with the trees.

The moral is that, if you're out to flathat,
Think of Jeremy A. 'fore you try it.
If you're going to toss out common sense and all doubt,
Don't buzz the farm – you may buy it!

By LT Norm Lane, MSC, USN

Letters

VR Pilots Above the Average

NAS Dallas, TX – In the OCT '76 article entitled "What's Your Approach Plate IQ?", LT Bob Harler closed with a paragraph stating in part that in his experience "the average Fleet pilot would miss 50 percent of these questions." This statement interested me since the questions were basic, straightforward, and apparently easy to answer.

As a test, I administered this exam to VR reserve pilots and navigators on three separate weekends, and their grade average was 95 percent. The most commonly missed question was number 10, which concerned HAT (height above touchdown). I believe the reason this one was missed was because people confused HAT with the radar altitude height of a CAT II approach because of the way the question was worded.

Perhaps more credit should be given the professionalism of the "average Fleet pilot" and his concern for the safety of his crew and passengers.

LCDR Al Herndon
VR Program Manager

● **The test results of your reserve pilots and navigators are certainly commendable. LT Harler's comments about the "average Fleet pilot" referred only to the "average" pilot going through annual jet instrument training. This means the community is limited to VA/VF/VC and other jet aviators whose mission requires that they do little cross-country/airways flying. Thus they have nowhere near the exposure to instrument rules and procedures that the VR community has. This is the very reason for the annual formal instrument ground school and flight syllabus.**

Re "A Near 'Gotcha'"

NAS South Weymouth – We have had many close calls similar to the one described in the Anymouse section of the DEC '76 APPROACH – and we've done something about it! The photo shows what we've done.

Before an AE enters the doppler well or other out-of-sight areas he first installs an adjustable, chest-high warning flag across the entrance door of the aircraft. This warns anyone entering the aircraft that someone is inside. We've found this helps to create a safer working environment. For nighttime we have added reflective tape to the warning flag and light it with a small pen-type flashlight to make visibility easier.

Also, we've painted the inside top of each doppler hatch and the hydraulic service center hatch with high-visibility orange paint, to reduce the chance that someone might fall through the open hatches. The bright orange paint stands out even when entering the dim interior of the aircraft from brilliant light outside.

One other point we want to make to enhance safety is the use of slip-on safety shoes. Their use is a fine idea and highly recommended for any maintenanceman working around aircraft.

AE1 K. C. Owings
VP-92 QAR

A Serious Situation

FPO – One afternoon the word was passed on an LPH, while at flight quarters, to conduct an emergency stations drill (phase I of abandon ship). Approximately 400 ship's company and troops were mustering on the flight deck when a CH-46 pilot made a call to Pri-Fly declaring a low fuel state.

A low fuel call is an advisory call requesting no undue delay. The pilot requested clearance to land and received it. Pri-Fly exercised due concern for the safety of the helicopter crew, but ignored the safety of several hundred exposed and unprotected personnel on the flight deck.

Mustering parties were advised over the 1MC speaker that a low fuel aircraft was inbound and would land on spot No. 7. Then, realizing that the area was cluttered with people, an announcement was made

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request. Address: APPROACH Editor, Naval Safety Center, NAS Norfolk, VA 23511. Views expressed are those of the writers and do not imply endorsement by the Naval Safety Center.

for them to move forward on the flight deck. A period of 5 minutes elapsed between the first announcement and the helo landing.

No attempt was made to have the personnel take cover, and those mustering had not been issued any kind of safety or survival equipment. The CH-46 pilot landed and shut down safely, but what a setup for a catastrophe!

It is recommended that such drills not be conducted when flight operations are in progress. If that isn't feasible, then those on the flight deck should be issued appropriate safety gear, and the deck should be cleared if there's an actual or deferred emergency.

Capt R. Magus, USMCR
1st Lt D. DeArman, USMC

Buy Your Own *Nomex*

Wright-Patterson AFB, OH – I had a chance to read LCDR Lichtermann's letter and your reply concerning clothing under *Nomex* flight suits in the JAN '77 issue (pg. 29). Obviously, steps have been taken to provide *Nomex* underwear, but in the interim, those of your readers who care to give up some of their flight pay might consider the purchase of *Nomex* underwear available for auto racing applications.

Check out the latest *Road and Track, Car and Driver,* etc., and you'll find several firms offering complete outfits of underwear, including socks. The racing community has attacked the problem of burns on the exposed skin between the helmet bottom and top of the collar by using a *Nomex* "skirt" attached to the bottom of the helmet and tucked into the suit. This won't work with a flying helmet and mask, but a high turtleneck undershirt or *Nomex* scarf would give extra protection in this area.

The underwear available is not too expensive (everybody knows pilots are rich, anyway), and what it does cost seems well worth it for the protection provided.

Capt John W. Sheehan, USAF
Nuclear Safety Officer
Directorate of Safety

P.S. Great cover on the January issue. If it doesn't have a tailhook and the wings don't fold, the Air Force might want it.

• Thanks for the suggestion on buying *Nomex* underwear commercially. Now, if the Air Force really isn't interested in tailhook-equipped/folding-wing aircraft, we'd be happy to take over their F-4s and A-7s.

Availability of *Nomex* Underwear

Washington, DC – Just a bit more clarification on *Nomex* underwear and an update on its availability is offered.

Requisitioning of *Nomex* thermal knit underwear can begin immediately (FMSO Notice 10120 dated 5 November 1976 refers), without waiting for attrition of cotton "waffle weave" type. The Defense Personnel Support Center, Philadelphia, is the procurement agency for both, vice Aviation Supply Office (ASO).

The new *Nomex* item replaces the polyvinylchloride (Rhovl) antiexposure type underwear, and should be worn under all current antiexposure and cold weather winter flight gear. In addition, its use with the CWU-27/P summer flight coverall for intermediate protection is also encouraged.

Lionel I. Weinstock
NAVAIRSYSCOM

Explain the Acronyms

Washington, DC – APPROACH is a very informative safety publication. Much of aviation safety information can be used in

other safety endeavors, but we've got to understand the abbreviations and acronyms for the articles to make any sense!

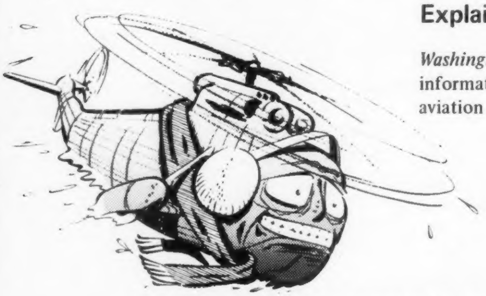
Could you take a couple of pages and explain things like LSO platform, CCA approach, TACAN, VASI, VFR, etc., etc.? It sure would make reading your publication much more interesting and usable.

Jimmy H. Johnson
Safety Officer, A.F.I.P.

• As CNO's ASO here at NAS NORVA, it's SOP to encourage safety among CIVLANT personnel as well as among HACs, PPCs, RIOs, and LAMPS Dets. Therefore, we've assigned a former *Corsair* driver some TAD so he could come up with a list ASAP.

Seriously, you have a good point, and it has been mentioned before. Since APPROACH is primarily directed to an aviation audience, we presuppose a certain level of familiarity with aviation terminology. The more unusual acronyms we do define.

Since, happily, our readership seems to be expanding beyond the active aircrew population, we have decided to act on your suggestion and publish, on a one-time basis, a list of the common aviation terms which we assume aviation personnel will know. Please retain this sheet, and we hope it will make APPROACH more readable and worthwhile for you.



CALL FOR PAPERS

THE Navy Helicopter Association invites representatives of industry and the military to submit papers for presentation at its annual convention in San Diego in May 1977. Although this year's theme will be focused on "evolution of helicopter to multimission VTOL," papers of both general and limited interest will be welcome on any subject related to helicopters and multimission VTOL and should not exceed 30 minutes. Audio and visual aids will be provided. Abstracts should be submitted to reach NHA, HSL-35, NAS North Island, San Diego, CA 92135 not later than 15 March 1977.

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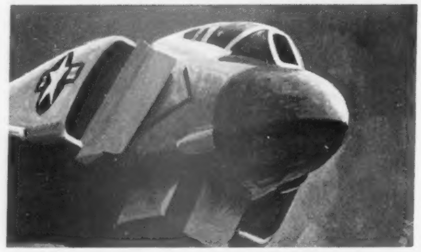

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A Naval Safety Center Publication

Our product is safety, our process is education, and our profit is measured in the preservation of lives and equipment and increased mission readiness.

PURPOSES AND POLICIES/APPROACH presents the most accurate information currently available on the subject of aviation accident prevention. Contents should not be considered as regulations, orders, or directives and may not be construed as incriminating under Art. 31, UCMJ. Photographs used to illustrate articles in APPROACH do not necessarily reflect the actual aircraft, air stations or ships that are described in the text.

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CREDITS/The F-3H *Demon* on this month's cover was the first jet to be equipped with the Sparrow air-to-air missile. VA-83's deployment to the Med with F-3Hs in March 1956 was the first deployment of a missile squadron. The painting is by staff artist Blake Rader.

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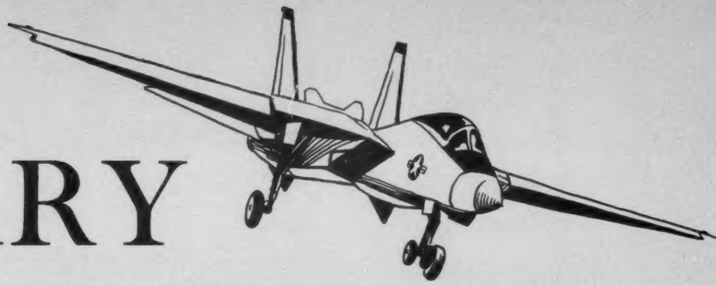
GLOSSARY



For the nonaviation personnel among our readers, below is a list of common acronyms used in APPROACH and their meaning/explanation.

AAR. Aircraft Accident Report.

ACM. Air Combat Maneuvering.

AOM. All Officer Meeting.

APC. Approach Power Compensator; a system used on carrier jet aircraft to automatically maintain optimum aircraft speed on a carrier approach.

ASO. Aviation Safety Officer.

B/N. Bombardier/Navigator; NFO in the A-6.

BOQ. Bachelor Officers' Quarters.

CAG. Carrier Air Group; old term for CVW. Commonly used to refer to the Commander of the Carrier Air Wing.

CATCC. Carrier Air Traffic Control Center.

CCA. Carrier Controlled Approach; instrument approach comparable to a GCA, except it is conducted aboard ship.

CNATRA. Chief of Naval Air Training.

CNO. Chief of Naval Operations.

CO/XO. Commanding Officer/Executive Officer.

CQ. Carrier Qualification.

CVW. Carrier Air Wing.

DD-175. Flight Plan that must be filed prior to non-local flights.

DME. Distance Measuring Equipment; also used interchangeably with distance.

FAR. Federal Aviation Regulation.

FCLP/FMLP. Field Carrier/Mirror Landing Practice; shorebased practice for carrier landings.

FOD. Foreign Object Damage; debris which damages jet engines when it is ingested.

GCA. Ground Controlled Approach; a type of instrument approach where a radar controller on the ground talks a pilot down to landing.

HAC. Helicopter Aircraft Commander.

HIFR. Helicopter Inflight Refueling; usually accomplished while in a hover over an aviation facility ship.

ICS. Intercockpit Communication System.

IFF. Identification, Friend or Foe; an electronic device in the aircraft used by air traffic controllers to identify aircraft. Different codes can be assigned to the aircraft.

ILS. Instrument Landing System.

JP-4/5. Types of jet fuel.

KIAS. Knots Indicated Airspeed.

LAMPS. Light Airborne Multiple Purpose System; helicopters launched from small deck, destroyer-type ships.

LSE. Landing Signal Enlisted; the enlisted man who assists helicopters in landing aboard carriers and other helo-suitable locations.

LSO. Landing Signal Officer; the man stationed on the "platform" at the aft end of a carrier who assists fixed-wing pilots in carrier landings. Also known as paddles.

MSL/AGL. Mean Sea Level/Above Ground Level.

NAS/NAF. Naval Air Station/Naval Air Facility.

NATOPS. Naval Air Training and Operating Procedures Standardization; a system for ensuring standardization of procedures for many different naval aircraft and activities. Every naval aircraft has a NATOPS manual which explains the aircraft systems and operating procedures.

NAVAIRLANT/PAC. Naval Air Force Atlantic/Pacific.

NFO. Naval Flight Officer; non-pilot officer crewmember.

NORDO. No Radio; aircraft that is unable to communicate due to radio failure.

OFT. Operational Flight Trainer; flight simulator.

OOD/SDO. Officer of the Deck/Squadron Duty Officer; the officer who is responsible for handling the daily routine of the squadron/ship/base.

OPNAVINST. Written instructions coming from the Chief of Naval Operations.

PAR. Precision Approach Radar; type of radar used in GCA approaches. Also used interchangeably with GCA to identify type of approach.

PIC. Pilot in Command.

PLAT. Pilot Landing Assistance Television; video tape camera that films all carrier landings and launches for later critique.

PPC. Patrol Plane Commander.

QA. Quality Assurance; branch of maintenance.

RAG/CRAW. Replacement Air Group/Carrier Replacement Air Wing; the old and new terminology for the units that train aviators in the Fleet aircraft they have been assigned to prior to their assignment to Fleet Squadrons.

RAT/EPP. Ram Air Turbine/Emergency Power Package; backup power systems that are driven by ram air.

RIO. Radar Intercept Officer; NFO in the F-4 and the F-14.

RON. Remain Overnight.

SAR. Search and Rescue.

SID. Standard Instrument Departure.

SOP. Standard Operating Procedures.

TACAN. Tactical Air Navigation; a piece of electronic equipment used as the primary method of air navigation for tactical jet aircraft.

UHF. Ultra High Frequency; sometimes used interchangeably to refer to the radio in tactical jet aircraft.

VA/VF/VP. Designations for different type squadrons; V refers to fixed wing; H refers to rotary wing. A is attack; F is fighter; P is patrol; T is training.

VERTREP. Vertical Replenishment; underway restocking of a ship via helicopters shuttling from a supply ship.

VFR/IFR. Visual Flight Rule/Instrument Flight Rules.

VMC/IMC. Visual/Instrument Meteorological Conditions.

VORTAC. Very high frequency Omnidirectional Range combined with a TACAN facility; two types of navigational aids.

Your safety requires the undivided consideration of others...

anything less costs lives.